



PAStimes

Phoenix Astronomical Society

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Vincenzo Cataldo to Speak at Nov 5 PAS Meeting

By Vincenzo Cataldo

I've been involved in planetary science research since 1998, the time I started studying towards a Master's at Lancaster University in the U.K. Despite having published several papers and abstracts, I only enrolled in a Doctoral program in 2013 and was awarded my PhD at ASU in 2020. I think of myself as a geologist and an astronomer and have been teaching several astronomy courses at a few community colleges in the Valley since 2016.

Research-wise, I created a 3-D fluid- and thermodynamic model to explain how lunar rilles formed. Lunar rilles are ancient lava channels that are thought to have formed billions of years ago when our Moon was fiercely active and a lava world.

At that time, umbrella-shaped volcanic plumes were towering higher than 100 miles above the lunar surface. Those plumes surely would have been a frightening yet spectacular sight if that primeval Earth had been inhabited.

"Use light instead of a pick axe to unravel planetary surfaces"

At the November 5th meeting, we will talk about something different. How can we learn about the surface of a planet without hammering rocks and holding rock samples in our hands? A tremendous amount of information can be gathered by replacing a geologist hammer with light. Yes...light. How? Well, allow me to see you first and I promise I'll tell you more.

(See Nov 5th Meeting, bottom of page 4)



Vincenzo provides this awesome photo of himself for the upcoming Nov 5th PAS meeting.

Fantastic Presentation at October 15 PAS Meeting

By Terri Finch, Event Manager

On a lovely Thursday evening, PAS held a General Meeting with a fantastic return Guest Speaker, Steven Desch. I wish to send Steve a million thanks for hosting this meeting. Not only was he the guest speaker, but PAS had a small issue finding someone who had the Pro version of Zoom on their computer, and the time to host the meeting. Steve came through for PAS. Thank you a ton, Steve!

Mike opened the meeting with a few brief opening remarks and then turned the meeting over to Steve. The info shared as well as the content and slide show were spectacular.

There were 34 attendees logged into this meeting and Steve had everyone's attention through the whole presentation. Thank you so much Steve! It was a well done presentation! Afterwards, I received many requests via email to have Steve return for another presentation in the near future. I wish to thank everyone for keeping their log in devices muted during Steve's main presentation. It was so nice to have ONLY Steve's data up on the screen until after Steve was done with Q&A.

Thank you all for attending this meeting. The next meeting is
(See October 15 Meeting on page 6)



*Steven Desch gave a marvelous presentation at the Oct 15 PAS Meeting.
Photo taken by Don Boyd.*

President	Mike Marron	480-488-3031	President@pasaz.org
Vice President	Paul Facuna	602-246-1554	VicePresident@pasaz.org
Secretary and Webmaster	Pete Turner		Webmaster@pasaz.org
Treasurer	Eric Steinberg		Treasurer@pasaz.org
Event Manager	Terri Finch	602-561-5398	Events@pasaz.org
Newsletter Editor	Don K. Boyd		Editor@pasaz.org
PAS Host	Stu Brackney	480-221-5711	stubrckney@gmail.com
Librarian	Rod Sutter		Librarian@pasaz.org
Member at Large	Jenny Neujoy	602-787-6818	
Member at Large/Equipment Manager	Bruce Wurst	602 909 8024	Brulipps@yahoo.com

Phoenix Astronomical Society 3241 E Shea Blvd #249 Phoenix AZ 85028-3365

Astronomy Equipment for Sale

By Terri, Event Manager &
Assistant Newsletter Editor

Do you have some astronomy related items you'd like to sell before the holiday season? Prepare an ad and send it my way so that Don and I can help you sell it through the club newsletter. PAS Members get this service for free. Let's make the December 2020 issue of the newsletter all

about astronomy items that need a new home. And you just might find your next wonderful, slightly used but extremely loved astronomy item in the December issue of the newsletter. Books, Star Charts, Telescopes, Eyepieces, Finder Scopes, and more. As long as it is astronomy related, I will happily add it to the newsletter. Please

include all items you wish to sell, and what is included with those items. Price them, and provide the contact info for the way you wish to be notified, such as email or phone number. I await your submissions to Events@pasaz.org. Start Today. Your deadline for the December issue is Nov 10th.

Place your Astronomy Equipment Ad in this Newsletter

Items for Sale listed in PAStimes Newsletter are written by the seller of the equipment being sold. PAS is not responsible for the ads and asks that anyone making a purchase from these ads, do your research and purchase at your own risk. PAS does not guarantee the quality of the items for

sale.

Ads in PAStimes run for a month and may be renewed on a month-by-month basis, if submitted by deadline (10th of month), space permitting. Ads in PAStimes are FREE to members. All others are asked to make a small donation to PAS. Dona-

tions are to be sent to Terri, the Assistant Editor, who will prepare your article for submission into the next month's issue. Email Terri at Events@pasaz.org to place an ad and get details on where to send the donation via a check.

See Items for sale, bottom page 4.

What's Up For November?

By Don K. Boyd, PAStimes Editor

Name	Date	Rise	Set
Mercury	11-15-20	5:33	16:36
Venus	11-15-20	04:32	15:57
Mars	11-15-20	15:27	04:03
Jupiter	11-15-20	11:27	21:28
Saturn	11-15-20	11:40	21:47
Uranus	11-15-19	16:30	05:52
Neptune	11-15-20	14:18	01:55
Pluto	11-15-20	11:28	21:25

All Times Arizona Time

Bold means the object is "visible" in the evening

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November 15, 2020

Sunrise: 7:00

Sunset: 17:25

Q3: November 8

New: November 14

Q1: November 21

Full: November 30





The International Space Station: 20 Years of Continuously Crewed Operation

By David Prosper

Did you know that humans have been living in the International Space Station, uninterrupted, for twenty years? Ever since the first crew members docked with the International Space Station (ISS) in November 2000, more than 240 people have visited this outpost, representing 19 countries working together. They have been busy building, upgrading, and maintaining the space station - while simultaneously engaging in cutting-edge scientific research.

The first modules that would later make up the ISS were launched into orbit in 1998: the Russian Zarya launched via a Proton-K rocket, and the US-built Unity module launched about a week and a half later by the Space Shuttle Endeavour. Subsequent missions added vital elements and modules to the Space Station before it was ready to be inhabited. And at last, on November 2, 2000, Expedition-1 brought the first three permanent crew members to the station in a Russian Soyuz capsule: NASA astronaut William M. Shepherd and Russian cosmonauts Sergei Krikalev and Yuri Gidzenk. Since then, an entire generation has been born into a world where humans continually

live and work in space! The pressurized space inside this modern engineering marvel is roughly equal to the volume of a Boeing 747, and is sometimes briefly shared by up to 13 individuals, though the average number of crew members is 6. The unique microgravity environment of the ISS means that long-term studies can be performed on the space station that can't be performed anywhere on Earth in many fields including space medicine, fluid dynamics, biology, meteorology and environmental monitoring, particle physics, and astrophysics. Of course, one of the biggest and longest experiments on board is research into the effects of microgravity on the human body itself, absolutely vital knowledge for future crewed exploration into deep space.

Stargazers have also enjoyed the presence of the ISS as it graces our skies with bright passes overhead. This space station is the largest object humans have yet put into orbit at 357 feet long, almost the length of an American football field (if end zones are included). The large solar arrays – 240 feet wide - reflect quite a bit of sunlight, at times making the ISS brighter than Venus to ob-

servers on the ground! Its morning and evening passes can be a treat for stargazers and can even be observed from brightly-lit cities. People all over the world can spot the ISS, and with an orbit only 90 minutes long, sometimes you can spot the station multiple times a night. You can find the next ISS pass near you and receive alerts at sites like NASA's Spot the Station website (spotthestation.nasa.gov) and stargazing and satellite tracking apps.

Hundreds of astronauts from all over the world have crewed the International Space Station over the last two decades, and their work has inspired countless people to look up and ponder humanity's presence and future in space. You can find out more about the International Space Station and how living and working on board this amazing outpost has helped prepare us to return to the Moon - and beyond! - at nasa.gov.

This article is distributed by NASA Night Sky Network. The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!



The ISS photobombs the Sun in this amazing image taken during the eclipse of August 21, 2017 from Banner, Wyoming. Photo credit: NASA/Joel Kowsky More info: bit.ly/eclipseiss



A complete view of the ISS as of October 4, 2018, taken from the Soyuz capsule of the departing crew of Expedition 56 from their Soyuz capsule. This structure was built by materials and 5 Russian Proton and Soyuz rockets, and assembled into orbit by 37 United States Space Shuttle missions and maintained by 230 spacewalks, with more to come! Credit: NASA/Roscosmos More info: bit.ly/issbasics

Occultation Timing of Asteroid Begonia on Thursday September 24, 2020

By Don Boyd, Paul Facuna, Sam Insana

Don, Sam and Paul decided to do an occultation timing of asteroid Begonia with star TYC 1329-01483-1 in the constellation Gemini. The occultation was calculated to occur early Thursday morning September 24, 2020 at 1:14:27 AM local time. Sam researched the position of the star in the night sky and where a good location for observing the occultation near Phoenix. The location had to have a clear view of the eastern sky near the horizon with no light pollution from city lights, no nearby street lights, and no headlights from traffic. The location he found was off state route 60 on Queen Valley Road two miles east of Florence Junction.

The week before the occultation, the fires in California were generating so much smoke that was floating into Arizona that the sky over Phoenix was hazy during the day with a bright orange sunset, not a normal yellow sunset, and the night sky was hazy too. The concern was that the smoke would obscure the dim star (magnitude 9.4) so that it could not be found or the occultation itself would be too obscure to see and record. Fortunately, by the day of the occultation the sky was much clearer so we decided to do the occultation.

We all met at the viewing site wearing masks and wore masks while any of us were together. The night sky was clear with a good easterly view. We set up the telescope, camera, laptop and other equipment and then looked for the first pre-point star.

The best method for recording occultations is to set up the telescope in a fixed position pointing at the point in the sky where the occultation will occur and let the rotation of the earth sweep the scope to the occultation point at the time of the occultation. In order to get the position and timing correct, stars are chosen that

are in the line of the occulted star but are ahead in time of the occultation. The time that each pre-point star is in the field of view must match the calculated time ensuring the telescope is pointed at the correct point in the sky where the occultation will occur. We matched all the pre-point stars at the correct times. When the time came we all stared at the laptop screen hoping to see the occultation as it occurred. Sam thought he saw the star dim, but he was not certain. Paul and Don did not see it dim. Sam located the occultation video and as it played WE SAW THE OCCULTATION!!!! WE WERE SUCCESSFUL!!! We were very



Photo #1 taken by Sam Insana. Photo of Don & Paul masked up and ready to do the Occultation Timing on Sept 24 2020 and the equipment they used.

happy, excited and satisfied that we were successful! Sam played it again and we visually estimated the occultation time as 2 seconds!!

Sam reported our findings the next day and submitted the video for digital analysis and confirmation.

Ted Blank, PAS member and active in occultation timing, digitally analyzed and processed the video for us. The analysis calculated the occultation lasting 3.1265 seconds.

Here is a link to the International Oc-

(See Asteroid Begonia on top of page 5)

Nov 5th PAS Meeting 7:30pm

(Continued from page 1)

By Terri, Event Manager

Please join PAS in welcoming Enzo Cataldo to PAS. Vincenzo Cataldo has spoken to PAS several times in the past and he comes to PAS this time with another fascinating presentation. The meeting will be held on Nov 5th. Please log into Zoom as early as 7pm with Mike Marron, President of PAS opening the meeting at 7:30pm. A

few brief announcements will be made and Vincenzo Cataldo takes the floor 7:40-7:45pm. We hope you can include your whole family in this Zoom meeting over the internet. The link to the meeting will be given on the PAS online Calendar for Nov 5th a few days prior to the meeting. Please mute the sound on your device so no one can hear you, and let's give Enzo our total atten-

tion and also please turn off your camera until the presentation has completed. Questions may be typed into the Chat for the meeting, and Vincenzo Cataldo can answer the questions at the end of his presentation. Everyone is welcome to attend. If there are any changes to the upcoming meetings, you can find them on the online calendar at www.pasaz.org.

Astronomy Items for Sale:

Obsession 20 inch f/5 telescope with OMI primary, with enhanced primary. 98% Brilliant Diamond enhanced secondary, in-

cluding ServoCAT GoTo drive with Argo Navis DSC. 20K upgraded res encoders, Upgrade to Feathertouch focuser. Asking

\$6,000. Bruce, bmende888@gmail.com.

Celestron CG-5/AVX/CGEM POLAR FINDERSCOPE - \$40, Orion SkyLine De-

lux Green Laser Pointer & Telescope Bracket - \$50. Contact Richard

Richard@sauerbrun.com.

Asteroid Begonia

(Continued from Page 4)

cultivation Timing Association (IOTA)
website: <https://occultations.org/>

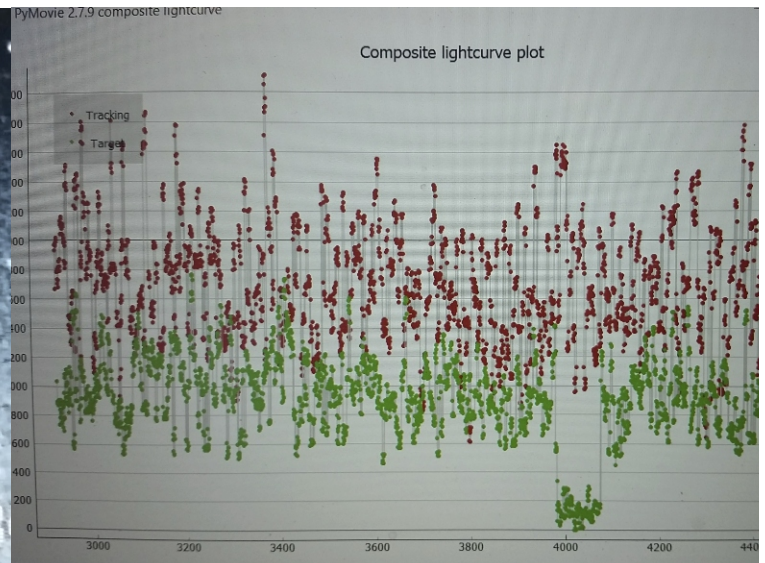
A link to some information on asteroid Begonia:
https://en.wikipedia.org/wiki/943_Begonia

A link to an asteroid modeling of Begonia <https://3d-asteroids.space/asteroids/943-Begonia>

A link to another Begonia website that provides some additional information about the orbit and location in the sky. If the charts, diagrams, and information is not for Phoenix and September 24, 2020, enter the date and Phoenix Arizona into the information boxes and press the "Update Chart" button: <https://in-the-sky.org/data/object.php?id=A943&day=25&month=9&year=2020>

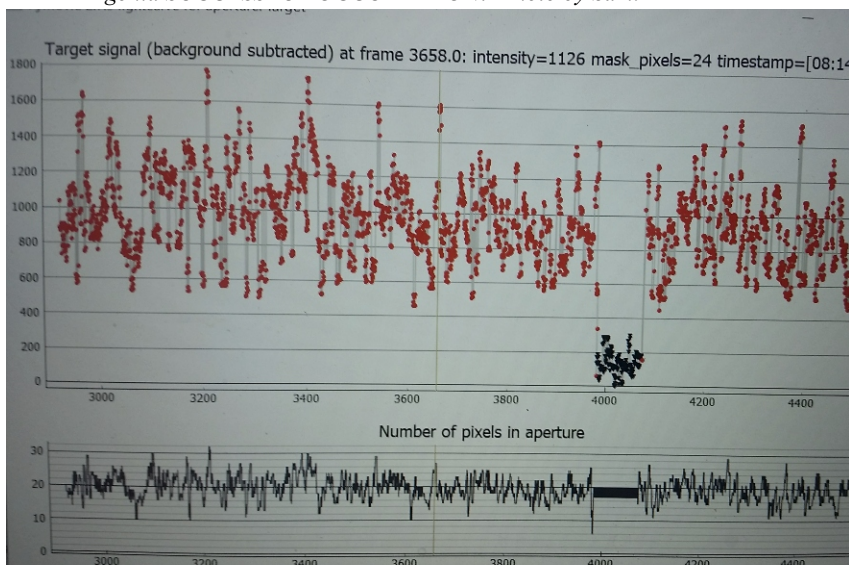


The star at 11420 six seconds before occultation (see arrow). by Sam.

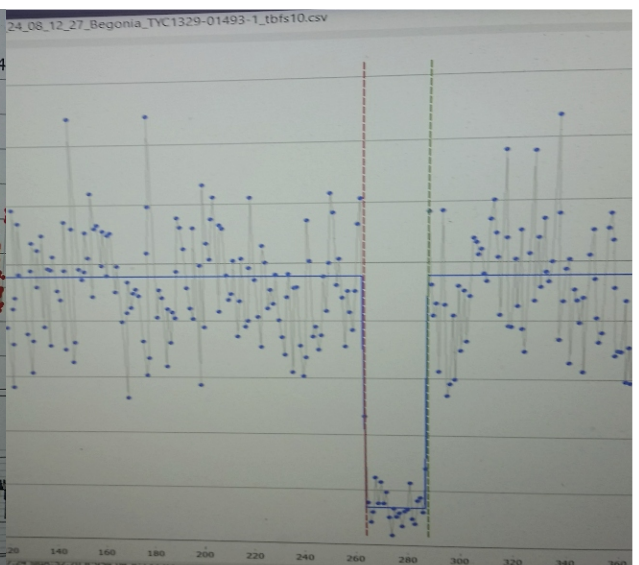


Star at 11426 disappearing (see arrow). This photo of star dimmed by Begonia **SUCCESSFUL OCCULTATION!** Photo by Sam.

All composite light analysis of Begonia occultation



Digital analysis with background noise eliminated Begonia occultation

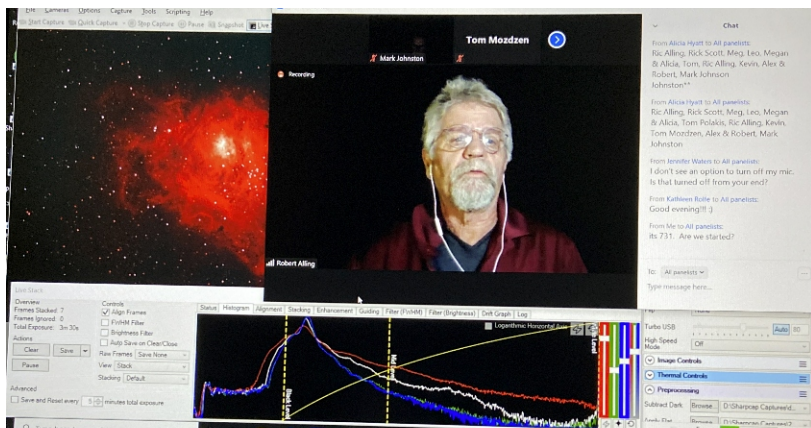


Occultation Data Results

ASU "International Observe the Moon"

By Mark Johnston

Sept 26, I supported the ASU "International Observe the Moon" event via Zoom live streaming. We had 157 participants from at least Hawaii to eastern Canada. There were about 9 presenters from ASU, EVAC, and myself representing PAS. Most people showed the Moon, one showed Jupiter with a nice Ganymede transit in process, and I showed M8 and M27. This was my first live test of EAA and it went well. ASU is likely to request my help with future events. Attached are photos of my setup, and a snapshot of the ASU moderator with my M8 image behind him.



Mark Johnston provides this image: A snap shot of the ASU moderator with my M8 image behind him.



Mark's set up for this remote viewing for ASU's International Observe the Moon Night event that was held on Sept 26 2020. Photo by Mark.

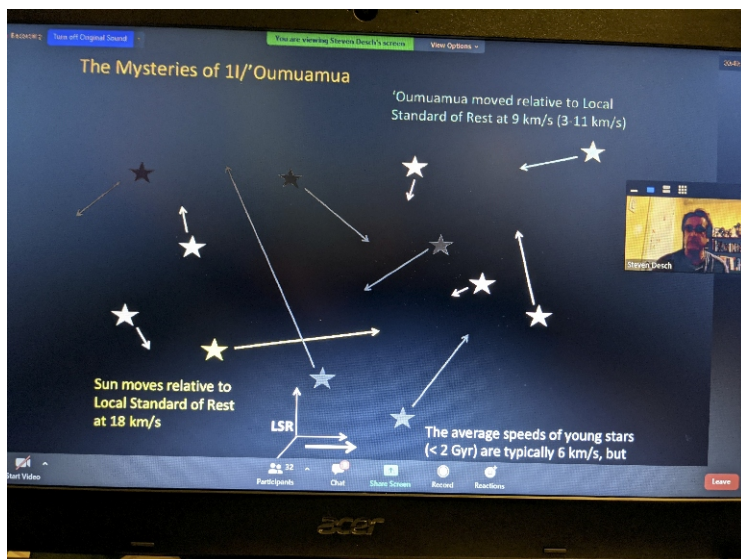
October 15 Meeting

(Continued From page 1)

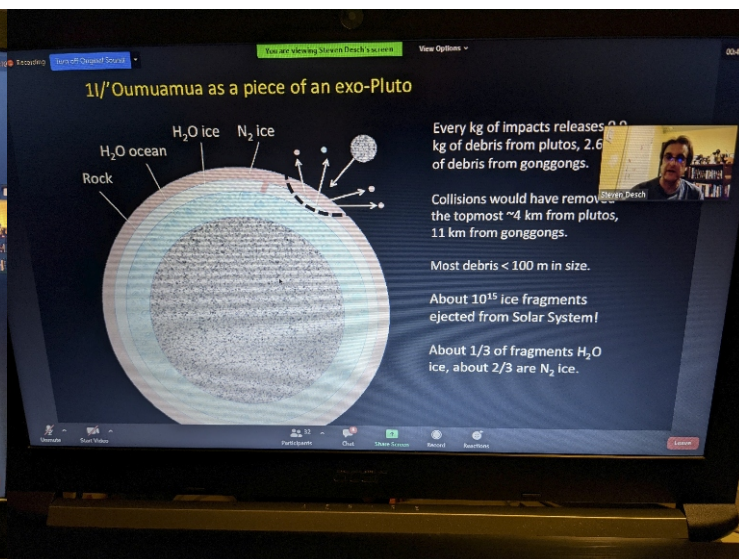
set for Thursday Nov 5th. PAS is back on schedule of General Meetings on the 1st Thursday of the month. We hope to see you at this next meeting when we have Enzo

Cataldo to enlighten our minds! If you are interested, Steve shared the link to the article he wrote. You can find it at this link: <https://slate.com/technology/2019/01/oumu>

[amua-alien-ship-anthropomorphize-space.html](https://slate.com/technology/2019/01/oumu)



The data shared by Steve was very interesting and informative. Steve had a captive audience. Photo by Terri.



Piece of an Exo-Pluto. This is one of the slides Steve shared with the attendees of the meeting. Photo taken by Terri Finch.

Doney Observing Session Sept 16

By Mark Johnston

Diane and I went up to the dark Doney site Wednesday night, and observed with a Flagstaff friend of mine and another guy from the Coconino astronomy club. Super dark (SQM 22.0) but some smoke/haze from California obscured the fainter stars.

Nevertheless we had a good evening. I imaged about 37 objects. Here are some highlights of my EAA captures. The maximum duration exposure was the Horsehead at 5 minutes. Typically 2 minutes.

Helix, Horsehead, M8, M20, M42 and the Running Man, NGC891, Crescent Nebula, Stephan's Quintet and NGC7331, Western Veil, M52 and the Bubble Nebula, Cocoon and dark nebula, and the Crab Nebula. Several of these were the first time I'd seen the objects.

I'm hoping conditions there are transparent for the October new moon which might be the last time it's warm enough to observe there for an extended period of time before spring.

These photos were all taken with my normal TEC140ED APO, an APEX-L 0.65x focal reducer, and ZWO294MC cooled camera. The nebulas were taken with an Optolong L-Enhance filter, the galaxies and star clusters had no filter. I did some post processing adjustments with Photoshop Elements but the pictures are pretty similar to the live view and what I'd show in an EAA event.

See more photos on pages 8 and 9



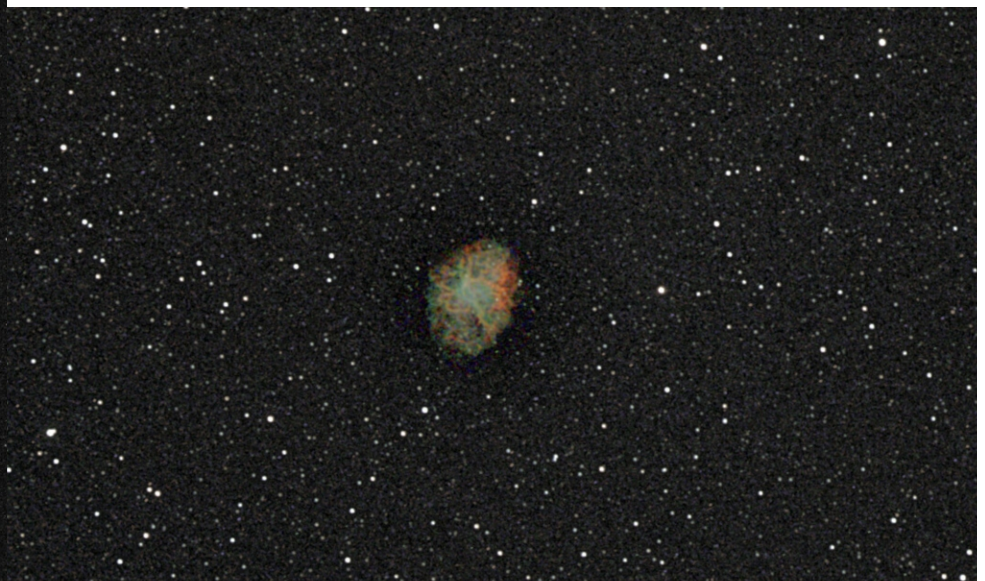
Bubble Nebula



Cocoon Nebula



Helix Nebula



Crab Nebula

Doney Observing Session Sept 16



Horsehead Nebula



M 8 Lagoon Nebula



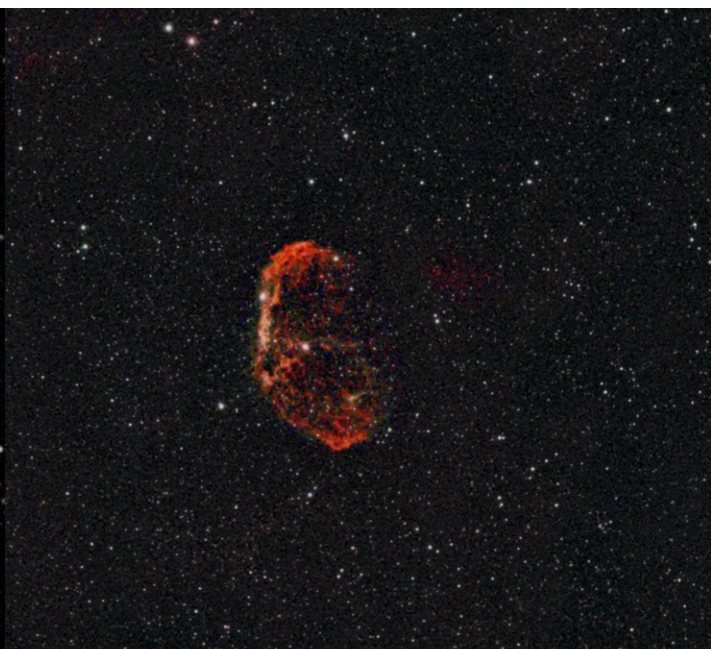
M 20 Trifid Nebula



M 42 Orion Nebula & M 43 Running Man



NGC 891 Galaxy

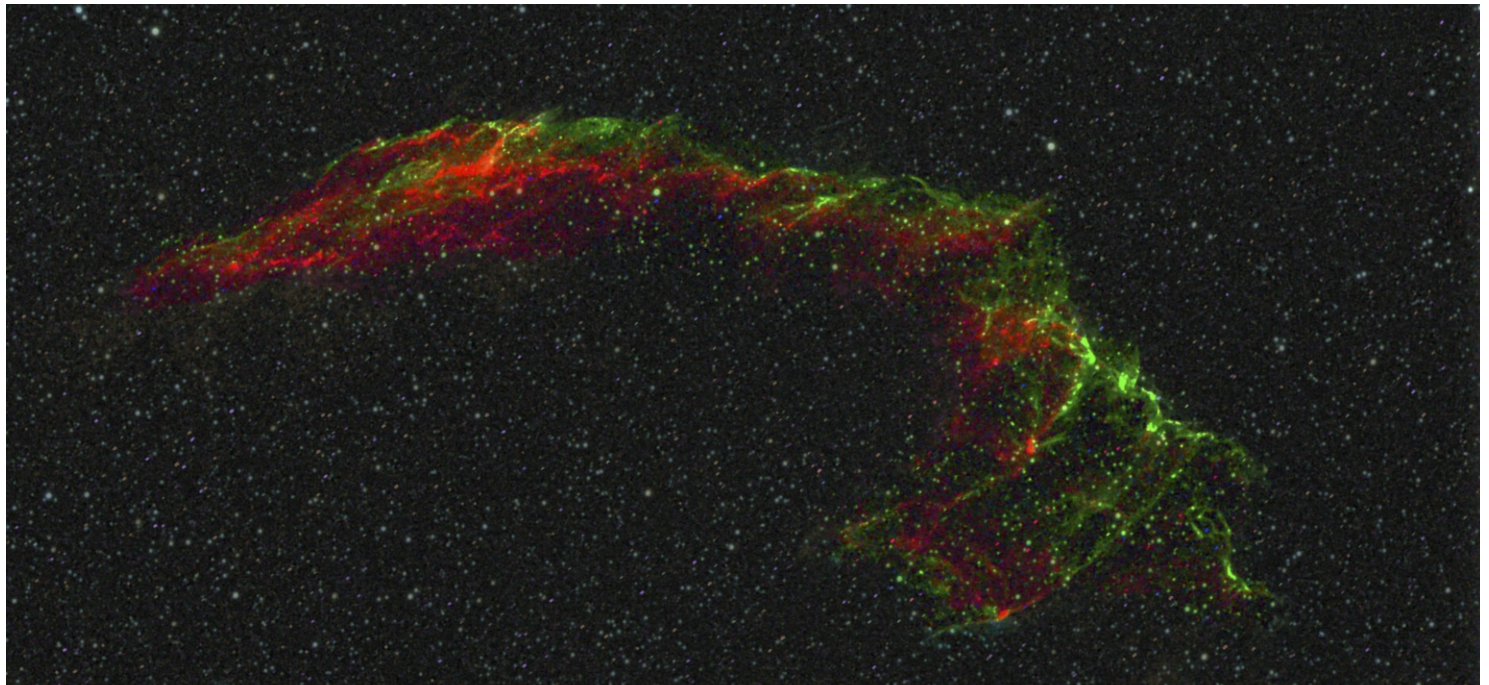


NGC 6888 Crescent Nebula

Doney Observing Session Sept 16



Stephan's Quintet - a visual grouping of five galaxies



West Veil Nebula

2020/2021 PAS GUEST SPEAKERS

By Terri Finch, Event Manager
Events@pasaz.org

Due to the Covid-19 pandemic, PAS Meetings are being held via Zoom over the internet. It is planned that a few days before the meeting, the Zoom link will be added to the calendar listing for that night's meeting.

Please visit the PAS calendar to find out more about these upcoming Virtual Meetings and Guest Speakers.

Do you have an idea for a guest speaker? Email Terri Finch, Paul Facuna, or Mike Marron the details (their email addresses are at the top of page 2 of this newsletter).

Here are the next scheduled guest speakers at PAS:

Dec 3: Dr. David Williams, Title: "Titan: The Past and Future Exploration of Saturn's Largest Moon."

Jan 14, 2021: TBA

Feb 4: Tom Field, Title: TBA